DOCUMENT RESUME

ED 386 450 SP 036 211

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TITLE Time and Education: Postmodern Eschatological Perspectives.
PUB DATE 22 Apr 95
NOTE 43p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 18-22, 1995).
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Educational Principles; Higher Education; Literature Reviews; *Philosophy; *Time; *Time Factors (Learning); *Time Management; *Time Perspective
IDENTIFIERS *Chaos Theory; Metaphysics; *Postmodernism; Theology

ABSTRACT

This paper discusses postmodern philosophical conceptions of time as they might inform educational theorizing, and it challenges the underlying assumptions about time in current educational reform literature, especially the 1994 Report of the National Commission on Time and Learning entitled "Prisoners of Time" (U.S. Department of Education, 1994). The paper deconstructs the notions of time as linear, hierarchical, and quantifiable and proposes instead a proleptic or eschatological view of temporality. Time has traditionally been incorporated into educational research as a variable to be controlled, managed, or manipulated in order to improve instructional goals, classroom management, and evaluation results. These efforts to manipulate time as an isolated, independent, and quantifiable variable are based on the assumption that the universe was created in time and space as opposed to time and space being interwoven into the very essence of the cosmos. This paper proposes an understanding of time based on a simultaneous experience of past, present, and future. This proleptic eschatology confronts the underlying assumption in contemporary educational literature and research that time can be quantified and used as an independent variable. Rather than defining teachers as "prisoners of time" who met efficiently manage, effectively organize, appropriately delegate, and creatively invest time, educators are challenged to envision their lives as functioning within a larger dynamic ecosystem with past, present, and future integrated simultaneous into the very fabric of existence in a postmodern process of becoming. (Contains 44 references.) (Author)

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ED 386 450

Time and Education:
Postmodern Eschatological Perspectives

A Paper Presented at the 1995 Annual Meeting
of the American Educational Research Association
San Francisco, California
April 22, 1995

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Note: A longer and slightly different version of this paper will appear in a forthcoming issue of *Harvard Educational Review* in 1995.

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SP036211

Abstract

This paper discusses postmodern philosophical conceptions of time as they might inform educational theorizing, and it challenges the underlying assumptions about time in current educational reform literature, especially the 1994 Report of the National Educational Commission on Time and Learning entitled *Prisoners of Time*. This paper deconstructs modern notions of time as linear, hierarchical, and quantifiable and proposes instead a proleptic eschatological view of temporality. Time has traditionally been incorporated into educational research as a variable to be controlled, managed, or manipulated in order to improve instructional goals, classroom management, and evaluation results. These efforts to manipulate time as an isolated, independent, and quantifiable variable are based on the assumption that the universe was created in time and space as opposed to time and space being interwoven into the very essence of the cosmos. This paper proposes an understanding of time based on a simultaneous experience of past, present, and future. This proleptic eschatology confronts the underlying assumption in contemporary educational literature and research that time can be quantified and used as an independent variable. Rather than defining teachers as "prisoners of time" who must efficiently manage, effectively organize, appropriately delegate, and creatively invest time, educators are challenged to envision their lives as functioning within a larger dynamic ecosystem with past, present, and future integrated simultaneously into the very fabric of existence in a postmodern process of becoming.

Introduction

Time has traditionally been incorporated into educational research as a variable to be controlled, managed, or manipulated for the purpose of advancing instructional objectives, improving classroom management, and enhancing evaluation results. Educational studies of time are rooted in modernists conceptions of segmentation and linear progress. This has resulted in an exaggerated emphasis on time management, timed tests, wait time, time on task, quantifiable results over time, time schedules, time-out discipline centers, allocation of instructional days on annual school calendars, carnegie units, time between classes, year round schooling, and the like. Research efforts designed to manipulate time as an isolated, independent, and quantifiable variable are based on the assumption that the universe was created in time and space as opposed to time and space being interwoven into the very essence of the cosmos.

Modern assumptions about the nature of time can be traced to the seventeenth century and the Newtonian vision of the universe as a giant clockwork mechanism with time marching forward in an irreversible trajectory, sometimes called the arrow of time. The popular adage "time flies" becomes a metaphor for modern life where the ticking clock and the flying arrow dominate human consciousness and control life experiences. Dwayne Huebner (1975) contends that the effort by educators to establish clear and unambiguous goals is a result of this dominant metaphor of time. This is a fanciful and idle search because it attempts to

remove educators from the difficult process of living historically. Huebner (1975) writes, "It has almost been assumed that if the educator can clearly specify his [or her] goals, then he [or she] has fulfilled his [or her] responsibility as an historical being. But historical responsibility is much too complex to be so easily dismissed" (p. 239). In this goal driven, clock oriented milieu time becomes a constraint, as demonstrated in this caution by Steve Tozer (1993), "Regardless of the teacher's style, aims, and orientation toward teaching, decision-making and problem solving with urgent time constraints are a recurring part of the teacher's routine" (p. 15). Good and Brophy (1990) similarly warn, "Classroom settings also impose constraints on what can and cannot be accomplished. Whether teachers instruct the whole class, divide the class into three or four groups, or allow students to work individually, they have limited time for one-to-one contact with students" (p. 19). The assumption here is that time is an external factor that constrains educators and restricts the teaching and learning process.

The modernist solution to this dilemma is to develop the technology and organizational structures that will reallocate time more efficiently. However, advanced technology designed to save time has compounded the problem by providing more information and more options without fundamentally altering the modern assumptions. History marches forward, adding more dates and events to the social studies syllabus; the science

curriculum expands as researchers identify new bacteria, viruses, and solar systems. New courses on parenting, AIDS awareness, drugs, computer literacy, multimedia technology, citizenship, and the like, are constantly being added to the traditional curriculum. Additionally, business, religious, political, and social organizations are demanding more access to the schools and the students. Educators are overwhelmed and frustrated as they try to implement ambitious goals, complete expanding curriculum materials, and accomplish more complex objectives with less and less time, while also trying to be sensitive to the national reform movement and the demands of the public for accountability. Compounding the problem, economic crises have forced a reduction in personnel, thus increasing the job demands on existing administrators and faculty. Moonlighting, overloads, and overtime have now become typical. Despite the negative impact of the modern conception of time on the human psyche, research continues to emphasize methods of restructuring, managing, or utilizing time to ameliorate the constraints experienced by contemporary educators.

The National Commission on Time and Learning report entitled *Prisoners of Time* (United States Department of Education, 1994b) challenges educators to fix the design flaw and use time in new and better ways: "We recommend that state and local boards work with schools to redesign education so that time becomes a factor supporting learning, not a boundary marking its limits" (p. 31). The assumption in this document is that if "world-class standards

in core academic areas" are established, then time can become a flexible resource. In order to reverse the limitation of fixed time, *Prisoners of Time* envisions a fixed curriculum where time becomes the flexible variable. However, in both scenarios, curriculum and time both remain quanitfiable objects capable of external manipulation. The document concludes: "American students will have their best chance at success when they are no longer serving time, but when time is serving them" (p. 44). This perspective is also summarized in a *Goals 2000 Community Update*: "Finding more and better ways to use time and learning must be at the heart of education reform efforts....Schools and communities need to rethink how time is used during the academic day and how schools might institute extended day and extended year programs" (U.S. Department of Education, 1994a, p. 1). Secretary of Education Richard Riley, citing from *Prisoners of Time*, contends, "Both learners and teachers need more time--not to do more of the same, but to use time in new, different, and better ways. The key to liberating learning lies in unlocking time" (U.S. Department of Education, 1994a, p. 1). This is the modern philosophy of time and curriculum that permeates contemporary educational literature.

Postmodern philosophies envision time in a very different context, a context that is urgently needed for a modern world that has reached a saturation point of stress. In *The Saturated Self*, Kenneth J. Gergen (1991) contends:

With the technology of social saturation, two of the

> major factors traditionally impeding relationships--namely time and space--are both removed. The past can be continually reviewed--via voice, video, and visits, for example--and distance poses no substantial barriers to ongoing interchange. Yet this same freedom ironically leads to a form of enslavement. For each person, passion, or potential incorporated into oneself exacts a penalty--a penalty of both *being* and of *being with*. In the former case, as others are incorporated into the self, their tastes, goals, and values also insinuate themselves into one's being....Each new desire places its demands and reduces one's liberties. (pp. 74-75).

And so it is with the insatiable desire for more time, more knowledge, more rigorous core curricula: our liberties are reduced and we actually become prisoners of time. This problem is exacerbated by the solutions proposed. However, the enslavement can only be appropriately addressed by first challenging the underlying modern assumptions about time itself. The postmodern eschatology perspective proposed in this paper challenges these modern assumptions.

Postmodernism understands time as internal experience, becoming, and process. John Dewey (1938) writes:

> The ideal of using the present simply to get ready for the future contradicts itself. It omits, and even shuts out, the very conditions by which a person can be prepared for

> his [or her] future. We always live at the time that we live and not at some other time, and only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future. (p. 49)

The postmodern challenge is to integrate the past and the future into the existential present--or "presence" as Martin Heidegger (1972) writes--allowing the process of becoming rather than artificial demands of clocks and linear sequences to dominate our personal and professional lives. In one sense, this understanding is reminiscent of many indigenous and premodern societies, as Mircea Eliade (1954) documents, that reject the notion of historical, concrete time in favor of a return to the mythical time of the beginning of the cosmos or the "Great Time." However, the postmodern phenomenology of time is more than a mere rejection of historical time and Aristotelian notions of time as a series of "nows" in succession. Time, in the Heideggerian sense, is presence.

Dwayne Huebner (1981) has investigated time and the curriculum and reconceives time as totality: "I mean seeing the part in terms of the totality, the present in terms of the past and the future, and recognizing that contradictions are also a mode of relationship that offers much understanding of the present moment as cause-and-effect relationship" (p. 136). Huebner insists that time is not a dimension in which we live, nor a sequence of events on a trajectory from past to future. We

do not simply look back on the past and await the future. Huebner (1975) contends, "The very notion of time arises out of man [and woman's] existence, which is an emergent. The future is [a person] facing himself [or herself] in anticipation of his [or her] own potentiality for being" (p. 244). Frederick Kummel (1965) echoes Huebner's sentiment:

> Generally, the future represents the possibility, and the past the basis of a free life in the present. Both are always found intertwined with the present: in the open circle of future and past there exists no possibility which is not made concrete by real conditions, nor any realization which does not bring with it new possibilities. This interrelation of reciprocal conditions is a historical process in which the past never assumes a final shape nor the future ever shuts its doors. (p. 50)

Alfred North Whitehead is even more insistent that time be understood as process. Whitehead (1933) writes, "Cut away the future, and the present collapses, emptied of its proper content. Immediate experience requires the insertion of the future in the crannies of the present....Each present occasion prehends the general metaphysical character of the universe, and thereby it prehends its own share in that character" (pp. 193-194). In addition to Heidegger, Huebner, Kummel, and Whitehead, many philosophers, educators, and physicists have wrestled with this notion of simultaneity and time, notably Henri Bergson (1946) who

spoke of time as "duration." Missing from the national report on time and education and other educational reform literature is a reflection on this body of literature that supports proleptic, phenomenological, and integrated views of time. Why is this ultimately of any importance to educators who, like the prisoners of time characterized in the 1994 report, are under stress from time constraints? Huebner (1975), perhaps, explains it best when he writes:

> Education recognizes, assumes responsibility for, and maximizes the consequences of this awareness of man [and woman's] temporality. The categories of learning, goal, purpose, or objective point to this awareness. Their present inadequacy is not a consequence of their inherent limitations; but, rather, the educator's failure to recognize these limitations. [The educator] expects them to perform work for which they are not designed. The challenge to the educator is to find a way to talk about [human] temporality which will increase [man and woman's] professional power in the world. (p. 244)

It is this search for new understandings of time and temporality that inspires this investigation.

The postmodern conception of time has been popularized in Michael Crichton's *Jurassic Park*. The scientist and chaos theorist in the novel explains the modern dilemma concisely. Crichton's (1990) character, Malcolm, contends:

> We do not conceive of sudden, radical, irrational change as built into the very fabric of existence, yet it is. An chaos theory teaches us that straight linearity, which we have come to take for granted in everything from physics to fiction, simply does not exist. Linearity is an artificial way of viewing the world. Real life isn't a series of interconnected events occurring one after another like beads strung on a necklace. Life is actually a series of encounters in which one event may change those that follow in a wholly unpredictable, even devastating way. That's a deep truth about the structure of our universe. But, for some reason, we insist on behaving as if it were not true. (p. 171)

Educators and researchers envision reality as linear when they conceive of time as an independent variable to be manipulated to improve educational outcomes. Postmodernism challenges this assumption and argues that our very understanding of time must first change before the stress of time constraints can be ameliorated and the educational process will become meaningful and consequential in the lives of teachers and students. Let us examine an example of how this might impact educators.

Time Management and Chaos in the Infinite Cosmos

Several years ago I was asked to conduct a one hour seminar for the Louisiana Leadership Academy, an ongoing certification

program for principals. The designated topic was "time management." For the next several weeks I was preoccupied and anxious about this presentation. I felt certain that the principals would be expecting a practical program with suggestions for improving their organizational skills in order to reduce the pressure of their demanding schedules, and I was not sure of the best method of conducting the seminar in order to address their very real day to day concerns.

Frustrated and uncertain, I immersed myself in time management literature: *Seven Habits of Highly Successful People* by Stephen Covey (1989); *The One Minute Manager* by Kenneth Blanchard and Spencer Johnson (1981); *Organize Yourself!* By Ronnie Eisenberg (1986); and the classic ethnography used in many leadership courses, *The Man in the Principal's Office* by Harry Wolcott (1973). I reviewed the time management methods that I had used myself as a principal: organizational flow charts; five year plans; delegation to department heads; computerized appointment schedules; comprehensive and detailed handbooks; a binder filing system; informative newsletters; and master calendars. As I prepared for this seminar all of the exhaustion of my career as a principal came rushing back into my memory. I remembered that no matter how well a school was organized and managed, the unexpected and unpredictable was the daily norm. I became exhausted remembering these incidents and the "last minute" adjustments that were a constant part of school administration. I also remembered the barrage of complaints,

especially from teachers, whenever the school schedule was disrupted. Time was viewed as a precious commodity to be allocated judiciously and interrupted sparingly.

School administrators know that randomness and chaos more accurately define their lives than predictability and stability, and yet modern schools remain organizaed around the modern conception of time as controllable and manageable. As I was preparing for this time management seminar, I also happened to be reading an article from the journal *New Scientist*. This article led me to several books on chaos theory and the new sciences including: *The Tao of Physics* by Fritjof Capra (1975); *The Reenchantment of Science: Postmodern Proposals* edited by David Ray Griffin (1988); *Order Out of Chaos: Man's New Dialogue with Nature* by Ilya Prigogine and Isabelle Stengers (1984); *Chaos: Making a New Science* by James Gleick (1987); *A Brief History of Time: From the Big Bang to the Black Holes* by Stephen Hawking (1988); *The Cosmic Blueprint: New Discoveries in Nature's Creative Ability to Order the Universe* by Paul Davies (1988); and, most significantly, *The Structure of Scientific Revolutions* by Thomas Kuhn (1970). The contrast between the two sets of readings was dramatic and disturbing.

Thomas Kuhn reminded me that one of the tasks of the historian of science is to "describe and explain the congeries of error, myth, and superstition that have inhabited the more rapid accumulation of the constituents of the modern science text" (1970, p. 2). The more I reflected on chaos theory, and the more

I recognized the problematic nature of organization in modern schooling, the clearer it was that I would have to change the focus of this time management seminar. Reading the following conclusion in Kuhn's book confirmed my conviction, "In both political and scientific development the sense of malfunction that can lead to crisis is a prerequisite to revolution" (p. 92). The sense of malfunction and crisis in education was abundantly clear, and thus Kuhn's hypothesis raised the possibility of a paradigm shift in the organization and curriculum of the schools in my mind. Chaos theory provided a metaphor as well as a scientific basis for a different view of time and education.

Chaos theory, according to William Doll (1991), gives meaning and substance to the language of disequilibrium, reflective intuition, surprise, puzzlement, confusion, zones of uncertainty, non-rationality, and metaphoric analysis. Doll (1991) writes, "Metaphoric analysis is hardly possible within a model structured around behavioral objectives, competency based performance, accountability, mastery learning, and effective teaching" (Cited in Caine and Caine, 1991, p. 19). It is the very disequilibrium itself that provides opportunities for creative tension and self-reflection. "Chaos" was first coined by physicist Jim Yorke who writes, "We tend to think science has explained how the moon goes around the earth. But this idea of a clocklike universe has nothing to do with the real world" (Cited in Briggs, 1992, p. 12). John Briggs (1992) describes chaos as a natural state of the universe, and he uses weather as an example,

"With its variability, general dependability, and moment to moment unpredictability, weather infiltrates our schedules, sets or undermines our plans, affects our moods, and unites us with the environment and each other. Weather is also an example of a mysterious order in chaos" (p. 13). In 1961 at MIT Edward Lorenz discovered a disturbing fact. He realized that the mere accumulation of more information about variables related to the weather such as wind speed, humidity, temperature, lunar cycles, and even sunspots do not help to increase the accuracy of long-range weather forecasts. Dynamic and complex systems like weather, he discovered, are composed of many interacting elements, and the slightest perturbation has a significant impact on future patterns. Following Lorenz, researchers have examined all dynamic systems from the human brain to electrical circuits for evidence of chaos. Our interest here is the curriculum and the classroom where chaos theory and complexity can help us to understand the postmodern vision that challenges the static and controllable universe of classical physics. Here the traditional social science approach to research is challenged; complexity replaces certainty. Prigogine and Stengers (1984) have demonstrated that systems in equilibrium and disequilibrium behave differently, and that order can emerge out of chaos. James Gleick (1987) and Paul Davies (1988) contend that there is an emerging science of complexity that is built in part on the fact that hidden in apparent chaos are complex types of order. The postmodern curriculum encourages chaos, non-rationality, and

zones of uncertainty because the complex order existing here is the place where critical thinking, reflective intuition, and global problem solving will flourish. The standardization of rote memorization, conformity, control, and time management, following from the faculty psychology movement and scientific management, restrict learning to a one-dimensional level imposed uniformly upon students and teachers alike. In order to move away from standardization into complexity and this new zone of cognition, educators must adopt a new postmodern vision of time.

How is this postmodern vision possible within a bureaucratic paradigm committed to the principles of modernity? James Lovelock (1979) in his Gaia hypothesis provides an example based on the image of the Earth from the moon:

> The new understanding has come from going forth and looking back to the Earth from space. The vision of that splendid white flecked blue sphere stirred us all. It even opened the mind's eye, just as a voyage away from home enlarges the perspective of our love for those who remain there....We now see the air, the ocean and the soil are much more than mere environment for life; they are a part of life itself....There is nothing unusual in the idea of life on Earth interacting with the air, sea and rocks, but it took a view from outside to glimpse the possibility that this combination might constitute a single giant living system. (cited in Tucker, 1993, p. 11)

Lovelock contends that the vision of the Earth from the moon began a paradigmatic change in the relationship between human persons and the environment. In the same sense, a vision of education from the perspective of the new sciences can create a paradigm shift in our schooling practices that will replace the linear, objective, and time management models that have dominated our thinking. If this seems to be an exaggeration, consider the emphasis we place on managed time in schools from class schedules and bells to timed tests and examinations. Time is understood to exist as an independent metaphysical reality capable of being managed and organized for maximum efficiency.

Newtonian models and mechanistic systems on which modern educational paradigms are constructed ignore the developments in the sciences which indicate that social systems are interactive and open-ended, and that time is an integral part of the reality. Space and time are both entities that are interwoven into matter. Paul Davies (1990) observes, "Space and time are a part of the plan of the physical universe; they are not just the stage on which the great drama is acted out, but are a part of the cast. We have to talk about the creation of space and time as well as matter an energy....The world was made with time and not in time" (p. 11). Einstein set the stage for understanding space-time with his theory of relativity and his writings on electromagnetic radiation of atomic phenomena in quantum theory, both published in 1905. In his special theory of relativity, Einstein posited nature's inherent harmony, and he sought to find a unified

foundation of physics by constructing a common framework for the two theories of classical physics, electrodynamics and mechanics.

Relativity unified and completed the structure of classical physics, and it also drastically changed traditional concepts of space and time. The foundation of the Newtonian worldview became suspect. In relativity space is not three-dimensional and time is not a separate entity. Both are intimately connected in a four-dimensional continuum called space-time. It is now impossible to understand time outside of the context of space, and vice versa. Capra (1975) explains:

> There is no universal flow of time, as in the Newtonian model. Different observers will order events differently in time if they move with different velocities relative to the observed events. In such a case, two events which are seen as occurring simultaneously by one observer may occur in different temporal sequences for other observers. All measurements involving space and time thus lose their absolute significance. In relativity theory, the Newtonian concept of an absolute space as the stage of physical phenomena is abandoned, and so is the concept of an absolute time. Both space and time become merely elements of the language a particular observer uses for describing the observed phenomenon. (pp. 50-51)

Einstein expanded on the special theory of relativity to include gravity in 1915 with his proposal of the general theory of

relativity. While the special theory of relativity has been demonstrated by innumerable experiments, the general theory remains the object of investigation. However, it is widely accepted in the study of astrophysics and cosmology. Because gravity in the general theory has the effect of "curving" space and time, and thus abolishes the concept of absolute time and space, Capra (1975) will conclude, "Not only are all measurements involving space and time relative; the whole structure of space-time depends on the distribution of matter in the universe, and the concept of 'empty space' loses its meaning" (p. 52). Einstein set the stage for the emergence of the new physics and new ways of understanding the universe which informs Chaos Theory and complexity in the postmodern era. Time can no longer be separated from space. The past and future cannot be separated from the present. The curriculum cannot exist in an objective vacuum outside of the context of human consciousness.

Complex systems can improve in the midst of turmoil. Curriculum models based on modern visions of Newtonian physics attempt, like a clockwork universe, to impose uniformity. Every lesson, every goal and objective, must conform to predetermined principles, cultural forms, social structures, or curricular guides. The postmodern curriculum, on the other hand, is based on a new science: a complex, multidimensional, kaleidoscopic, relational, interdisciplinary, and metaphoric system. These complex systems in science and education challenge the Second Law of Thermodynamics, which sees the universe as running down as

entropy increases. Paul Davies contends that there is no claim that the Second Law of Thermodynamics is invalid, only that it is inadequate because it applies only to closed systems which are isolated from their environments. Davies (1990) writes, "When a system is open to its environment and there can be an exchange of matter, energy, and entropy across its boundaries, then it is possible to simultaneously satisfy the insatiable desire of nature to generate more entropy and yet have an increase in complexity and organization at the same time" (p. 10). Thus, the universe as a whole can be seen as a closed system while subsystems of the universe remain open to their environments. This is a crucial element in postmodern proleptic understandings of time: radical eclecticism necessitates an openness to diverse subcultures and environments that can increase in complexity. In the same sense, the curriculum is now seen as an open system that exists in complexity. After observing open and closed systems and their environments, the French Jesuit paleontologist Pierre Teilhard de Chardin (1959) wrote, "We are now inclined to admit that at each further degree of combination something which is irreducible to isolated elements emerges in a new order....Something in the cosmos escapes from entropy, and does so more and more" (cited in Davies, 1990, p. 10).

Something in the classroom and in the curriculum must also escape from entropy. William Doll contends that just as the physical sciences in the seventeenth century led society into modernity, the new physics is ushering in postmodernity. Doll

(1993) turns to Werner Heisenberg's "Uncertainty Principle" to support his claim. In traditional modern physics scientists believe that if they can improve their measurements and calculate with infinite precision, then absolute understanding of the universe and its physical properties--including time--would follow. Heisenberg disagreed, and he demonstrated that it does not matter how accurate the instrument or measurement because the act of measuring changes the outcome of the measurement process itself. Educators have always instinctively known this to be true. The presence of an observer in the classroom measuring effective teaching changes the dynamics of the lesson, impinges on the attitudes of the students and teacher, and dramatically alters the lesson being observed.

The Heisenberg Uncertainty Principle examines the subatomic world and contends that if we choose to measure one quantity (e.g., the position of the electron), we inevitably alter the system itself. Therefore, we cannot be certain about other quantities (e.g., how fast the electron is moving). Since an interaction is involved in every measurement, and since measurements are involved in observations in modern science and education, some physicists contend that the act of observation changes the system. While this applies to the interaction of particles in quantum physics, a few scientists are also beginning to extend this principle to the realm of consciousness as well. Further, since some particles exist so briefly, they are not considered to be real, but "virtual." Thus, the universe as we

know it is ultimately based on chance and randomness at the subatomic level. Can quantum physics inform our understanding of time and education? Let's explore further.

In classical physics, everything is known and can be measured. In quantum physics, uncertainty is built into the metaphysical reality. Position and velocity of an electron cannot be measured simultaneously, not because the observer is not looking carefully but because there is no such thing as an electron with a definite position. Electrons are "known" only in their relationship to other electrons. Electrons do not orbit the neutron like a planet, as most physics books reported until recent years. Rather, an electron exists in a cloud like a twin. Neither a particle nor a wave, the electron is described more by its relationship and potentiality rather than its actuality. Each electron, in a sense, enfolds in itself the universe as a whole and hence all its other parts, emphasizing internal relatedness. In the postmodern curriculum it does not make sense to evaluate lessons, students, and classrooms based on predetermined plans, outcomes, or standards, for like the elusive electron, relationships and potentialities explain their existence--and not predetermined structure. Fritjof Capra (1975) explains:

> The exploration of the subatomic world in the twentieth century has revealed the intrinsically dynamic nature of matter. It has shown that the constituents of the atom, the sub-atomic particles, are dynamic patterns

> which do not exist as isolated entities but as integral parts of an inseparable network of interactions. These interactions involve a ceaseless flow of energy manifesting itself as the exchange of particles; a dynamic interplay in which particles are created and destroyed without end in a continual variation of energy patterns. The particle interactions give rise to the stable structures which build up the material world, which again do not remain static, but oscillate in rhythmic movements. The whole universe is thus engaged in endless motion and activity; in a continual cosmic dance of energy. (p. 211)

Reading this passage reminds me of the motion and energy of classrooms and schools. If the universe on the quantum level and on the cosmic level is not rigid and fixed, why does our vision of curriculum, schooling, time, and research remain fixated on the metaphor of classical modern physics? William Doll (1993) contends that our current school curricula are not merely based on a scientific-efficiency model (Kliebard, 1986), "but have their foundations in seventeenth- to nineteenth-century modernist thought" (p. 158). The "naturalness" of this thought needs to be questioned, for what is self-evident in one paradigm becomes absurd in another. Doll (1993) continues, "In an intellectual time frame, Copernicus and Einstein represent the extreme boundaries of the modern paradigm, with Descartes and Newton as the medians. But, of course, as with any extremes, Copernicus

and Einstein also represent the bridges between paradigms, one with the pre-modern the other with the post-modern" (Doll, pp. 21-22).

What is this postmodern paradigm in the sciences that is revolutionizing educational theorizing and challenging the assumptions of time in educational research? David Ray Griffin believes that it is a reenchantment. At the root of modernity and its discontents is a disenchanted and mechanistic worldview that denies to nature subjectivity, experience, and feeling. Griffin (1988) writes, "Because of this denial, nature is disqualified--it is denied all qualities that are not thinkable apart from experience" (p. 2). A postmodern organic understanding of life provides the basis for a reenchantment of science that will support a new vision of time and the cosmos. Stephen Toulmin in *The Return to Cosmology: Postmodern Science and the Theology of Nature* contends that we must think about the cosmos as a single integrated system where all things in the world--human, natural, and divine--are related in an orderly fashion. This cosmic interrelationship--quantum interconnectedness--is central to the postmodern curriculum as well. Integrated learning, holistic models, and authentic assessment are the natural outgrowth of the new cosmic vision. David Bohm (1988) explains:

> Because we are enfolded inseparably in the world, with no ultimate division between matter and consciousness, *meaning and value are as much integral aspects of the*

> *world as they are of us*. If science is carried out with an amoral attitude, the world will, ultimately respond to science in a destructive way. Postmodern science must therefore overcome the separation between truth and virtue, values and fact, ethics and practical necessity. To call for this non-separation is, of course, to ask for a tremendous revolution in our whole attitude to knowledge. But such a change is necessary, and indeed long overdue. Can humanity meet in time the challenge of what is required? (pp. 67-68)

Likewise, can educators meet the challenge of what is required, especially by reconceptualizing time as a non-separation? Why is it so difficult to move beyond the modern paradigm to this postmodern vision? One of the reasons for our difficulty with moving to a postmodern vision is our modern attachment to practical solutions to resolve immediate problems. *Prisoners of Time* is an obvious example of this phenomenon. Classical physics provides the structures for addressing these types of concerns. In our daily experience we can function in what has been called the "zone of middle dimension" where classical physics and linear time can still be useful. On a daily basis we can deliberately remain oblivious to the quantum and cosmic phenomenon. Unaware of this dimension of space-time, we can convince ourselves that classical physics, traditional time management practices, extended school days or school calendars, and modern curriculum development paradigms, if

perfected, can solve the epistemological, ecological, sociological, and educational crises of society. We fail to recognize complexity and the interrelatedness of actions.

In support of the postmodern concepts, contemporary mathematics and physics turns to fiber-bundle theory and string theory in an effort to develop a unified field theory. Theoretical physicists are writing about higher dimensions of space, sometimes called inner space or hyperspace, which require new ways of thinking. Saul-Paul Sirag (1992) writes, "In some cosmic sense there really is only one consciousness....Hyperspace itself is consciousness acting on itself, and space-time is just kind of studio space for it to act out various things in....Our internal experience is not just connected to the hyperspace, it is an intimate part of the hyperspace" (pp. 108-109). As computer technology expands, the implications of hyperspace no longer seem so unrealistic! Postmodernism challenges us to enter this new zone of cognition and hyperspace. While the "zone of middle dimension" may have been useful in the development of technology and time in the modern era, the negative consequences of ignoring the quantum and cosmic dimensions of the physical universe threaten the survivability and viability of life. Postmodern visions of hyperspace and space-time must be infused into our understanding of schooling. Documents like *Prisoners of Time* hinder the emergence of the new paradigm by ignoring the new sciences.

What is this new conception of curriculum as chaos? First,

it is not destructive and purposeless. William Doll (1993) explains chaos concisely in reference to a phase space diagram of a nonlinear system, commonly called a Lorenz attractor, after Edward Lorenz who first used this type of graph to show a systems view of weather patterns:

> First, chaos is not a wild, random abandon. Far from it; the pattern is quite orderly but complex. Chaos refers to this complex ordering. It is not possible to predict with complete accuracy where the next point on the trajectory will be (no two trajectories repeat exactly), but neither do the points fly beyond the bounds of the diagram. Two, the trajectories have both "bounds" and a center "attractor" area. Neither of these are precisely defined, but as the trajectories fly out from the center area they are attracted back, only to fly out again. The system, in its dynamic tension between moving out and back, has an overall coherence. Three, on occasion, any given point on the trajectory will "flip over" from one "owl's eye" or "butterfly wing" to the other. These "flip over" events are certain to happen over time but unpredictable for any given moment. One cannot say when such a flipping will occur, only that it will. The pattern is random, but it is a pattern. (p. 93)

Reread this passage from Doll's text again, substituting the classroom for the phase space diagram. Think of student

experience when reading about flip over events. Replace chaos with a dynamic interchange in the classroom during which many students are anxious to contribute. Chaos in the classroom is such an event. First, there is a central attractor--a thematic unit, an experiment, or a short story. Second, the discussion will move back and forth from one point to another without predictability--but the questions and comments are all contained within the framework of the lesson theme. Third, flip over events in the classroom are unpredictable and may lead to a dynamic integration of new ideas into the curriculum.

In summary, postmodern visions of space-time and hyperspace challenge the static clockwork universe of classical physics which was developed before thermodynamics. It also challenges the picture of the cosmos as nothing but a random collection of particles acted upon by blind forces and capable of being controlled by artificial structures. Newton gave us a picture of a uniform universe in which every particle moved according to strictly defined laws of motion where all events were the result of the unwinding of a gigantic clocklike mechanism. Time had no real significance because the state of the universe at all times and in all places is precisely determined. This is a sterile cosmology in which time is just a parameter and does not offer any opportunity for change, flux, unfolding, or chaos. It is the same conception of time that underlines the 1994 report *Prisoners of Time*. This document supports an ideology of false security. In the postmodern sense time management is impossible because the

universe is not created in time and space but with time and space.

The date for my seminar on time management for school administrators arrived. I was assigned the last session in the afternoon. The back of the room was filled with exhausted administrators who had been required to give up a Saturday for "leadership points." Some administrators left my seminar disappointed; they did not receive a list of new time-saving practices to organize their professional lives. Others left the seminar refreshed; they experienced an understanding of life-saving insights that would change their conception of space-time. Schooling in the postmodern era is a cosmic vision accessible to those educators willing to see order emerging in the chaos.

Postmodern Understandings of Time

As we have seen above, postmodern understandings of time challenge the linear arrow and progressive sequence of modernity. Time is not an irreversible trajectory where new and modern understandings are better than the outdated past. The following citations will begin our reflective journey toward a proleptic postmodern understanding of time:

"We are a people in whom the past endures, in whom the present is inconceivable without moments gone by. The Exodus lasted a moment, a moment enduring forever. What happened once upon a time happens all the time." Abraham Joshua Heshel

"There is no such thing really as was, because the past is." William Faulkner

"The present holds within itself the complete sum of existence, backwards and forwards, that whole amplitude of time which is eternity." Alfred North Whitehead

"The true present is nothing else but the eternity that is immanent in time. The believer is the one who is entirely present." Jurgen Moltmann

"Time, space, and causation are like the glass through which the absolute is seen....In the absolute there is neither time, space, nor causation." Swami Vivekananda

"To impose upon becoming the character of being--that is the supreme will to power....That everything recurs is the closest approximation of a world of becoming to a world of being." Friedrich Nietzsche

"The ideal of using the present simply to get ready for the future contradicts itself. Hence the central problem of an education based on experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences." John Dewey

"There must be another life, here and now, she repeated. This is too short, too broken. We know nothing, even about ourselves. We're only just beginning, she thought, to understand, here and there. She held her hand hallowed; she felt that she wanted to enclose the present and future, until it shone, whole, bright, and deep with understanding." Virginia Woolf's *The Years*

"The postmodern reply to the modern consists of recognizing that the past, since it cannot really be destroyed, because its destruction leads to silence, must be revisited: but with irony not innocently....Irony, metalinguistic play, enunciation squared. Thus, with the modern, anyone who does not understand the game can only reject it, but with the postmodern, it is possible not to understand the game and yet to take it seriously. Which is, after all, the quality (the risk) of irony. There is always someone who takes ironic discourse seriously....I believe that postmodernism is not a trend to be chronologically defined, but rather an ideal category or, better still, a *kunstwollen*, a way of operating." Umberto Eco from *The Postscript to The Name of the Rose*

The preceding thoughts create an image of time and space that is very different from the irreversible and progressive sequence of modernity. Postmodernism reconceptualizes time as duration; post-structuralism as eternal recurrence. On the one hand, time is a duration where the past is embedded in the

present, as Henri Bergson contends. On the other hand, for Nietzsche, nothing abides, but all returns to be destroyed again and again. The *process* of becoming endures, but nothing *in* that process endures, except as repeated enduring states. Modern notions of being, Nietzsche contends, have arisen from discontent with becoming. Eternal recurrence is more than "mere" becoming, it reveals the eternal value of every moment. In both duration and eternal return, Bergson and Nietzsche reject modern notions of linear time in favor of the process of becoming which is so integral to postmodernism.

The crisis of modernity arises precisely because history and time are conceived of as linear, and thus capable of being broken. If the present can be broken, it can also be conceived of as degraded and meaningless. Then the modern pathos is projected backward and forward, projecting this vision on every present--past, present, and future. Postmodernism reconnects space-time with individuals and society in order to transcend this modern embedded pathos. James Macdonald (1988) writes, "The impetus for choosing and becoming in us is not something that need be externally imposed; but it is rather a process of helping others see possibilities and helping them free themselves from going beyond this present state of embedded existence" (p. 163). Postmodern schooling must reconnect students and teachers, space and time, meaning and context, knowing and the known, humanities and sciences, and especially past, present, and future. What modernity has rent asunder, postmodernity reevaluates as

radically eclectic by embracing the fragmented beauty. Postmodernism celebrates the process of becoming and the interdependence of eternal becoming.

A Proleptic Educational Proposal

Postmodern education must ultimately understand time as proleptic. The past and the future are only comprehensible in the context of the present; they do not exist independently. The artificial bifurcation of time and the linear arrow of time must be challenged. Educators must infuse the curriculum not only with a proleptic philosophy, but most important a proleptic experience. The proleptic experience seeks to infuse hope into the postmodern vision of schooling by giving meaning and purpose to the present occasions in education, occasions that emphasize the process of becoming rather than the quantification of being. Thus, it is impossible to be prisoners of time any longer, for we are always in the process of becoming.

Why is this proleptic philosophy so important? Students and teachers are limited by the concepts of time perpetuated by modernity. The bifurcated choice of modernity is clear; either choose the apocalyptic vision of many fundamentalist religions and delay all hope to a distant time in the future or after death, or collapse all time into the present for the immediate gratification of the senses. The first is called futuristic or apocalyptic eschatology because the present is disconnected from the ultimate experience of salvation or utopia. (How often do we

warn our students to work hard now to prepare for a goal in the future? How often do we remind students that they are the future of the world?) The second is called realized eschatology because the past and future do not affect the present sense experiences which contain the only metaphysical reality. (Do we really believe that since we only go around once in life we must grab all of the gusto we can get while we can?) Apocalyptic and futuristic eschatology have both deformed consciousness in the modern era and caused the repression and suppression of the complexity of the human dynamic in the process of becoming in the present moment. Realized eschatology reinforces the addictions and malaise of modern society.

Humanity desperately needs a postmodern alternative to these two dominant eschatologies that have blurred, and ultimately destroyed, the vision of the eternal recurrence and the interconnectedness of past, present, and future. A proleptic curriculum offers a postmodern vision of justice, complexity, compassion, ecological sustainability, spirituality, and internal relatedness. A proleptic understanding of the integration of time, place, and self is one of the most essential elements of curriculum development for the postmodern era (Slattery, 1992).

Theological Understandings

Proleptic eschatology has philosophical roots in the twentieth century writings of Ernst Bloch (1968, 1970, 1986), Henry Nelson Wieman (1969a, 1969b), Jurgen Moltmann (1967), and

Carl Peter (1974). Moltmann and Peter explain that Jesus Christ, as the fullness of God, entered historical time as both God and human. Therefore, the Christ had an "end in view" experience of the resurrection prior to the actual event. Jesus Christ, for Christians of faith, had already experienced the resurrection in the timelessness of the eternal Godhead prior to his death on the cross.

This is not a strange new theology. The early Christian communities denounced many heresies in the centuries following the death of the historical Jesus, including Arianism which was condemned by the Council of Nicaea. Originating with the Alexandrian presbyter Arius (d. 336 CE), Arianism taught that Jesus Christ could not be considered the "Son of God" except is some subordinate or inferior sense. The "Son" was not considered the same as "The Father," and thus there was a time when the "Son" did not exist. The Council of Nicaea contested this theology vociferously, arguing that Jesus the Christ was the same substance (*homoousios*) as God "The Father." Various forms of Arian theology were popular in the fourth century, CE. Therefore, the Nicene Creed, still recited in many Christian churches today, repeated the *homoousios* several times to reiterate that Jesus Christ was "True God from true God." The creed continues that Christ was "Begotten, *not* made. *One in being* with the father. Through the Christ all thing were made. For our salvation Jesus came down from heaven."

The insistence here is that Jesus Christ is identical in

being with the timeless, eternal Godhead. This theology is called proleptic because the future is not distant and separated from the present, rather it is embedded in the present. In a similar fashion in literary theory, prolepsis refers to events preceding the beginning of a novel or short story. Flashbacks, foreshadowing, and *deja vu* are literary devises used to create a prolepsis. Bloch calls this the experience of the "already but not yet," Wieman calls it the "growth of creative interchange," Moltmann calls it the "eschaton, the horizon with God ahead," and Peter calls it "the lure of the transcendent benevolent future." In curriculum theory prolepsis is indicated by Gadamer's "fusion of horizons," Dewey's "social consequences of value," Greene's "landscapes of learning," Freire's "praxis," Pinar's "currere," Padgham's "becoming," Macdonald's "hermeneutic circle," W. Doll's "transformative recursion," Griffin's "sacred interconnections," Bergson's "duration," Nietzsche's "eternal return," and M. A. Doll's "dancing circle." These eschatological sensitivities suggest movement toward a postmodern proleptic curriculum theory. The proleptic experience seeks to infuse hope into the postmodern vision of schooling by giving meaning and purpose to the present occasions in education.

What is this proleptic vision for postmodern education? While definitions and metanarratives of this emerging paradigm are to be resisted, this essay has presented a vision of time and postmodern education that is radically eclectic, determined in the context of relatedness, recursive in its complexity,

autobiographical intuitive, aesthetically intersubjective, phenomenological, experiential, simultaneously quantum and cosmic, ironic in its kaleidoscopic sensibilities, and ultimately, a hermeneutic search for greater understanding that motivates and satisfies us on the journey. With T. S. Eliot (1971) we can conclude that time does not march on and that we are not prisoners enslaved in a clockwork universe, for time eternally recurs as duration: "We shall not cease from exploring, and the end of all our exploring will be to arrive where we started, and know the place for the first time."

REFERENCES

Bergson, Henri. (1946). *The creative mind: An introduction to metaphysics*. (M. L. Andison, Trans.). New York: Philosophical Library.

Bernard, Hilly, & Slattery, Patrick. (1992). Quantum curriculum. Dayton Ohio: *JCT* Bergamo Conference. Unpublished paper.

Blanchard, Kenneth, & Johnson, Spencer. (1981). *The one minute manager*. New York: Berkeley Books.

Bohm, David. (1988). Postmodern science and a postmodern world. In David Ray Griffin (Ed.), *The reenchantment of science*. PP. 57-68. Albany: State University of New York Press.

Briggs, John. (1992). Fractals, the pattern of chaos: Discovering a new aesthetic of art, science, nature. New York: Simon and Schuster.

Caine, Renate Nummela, & Caine, Geoffrey. (1991). *Making connections: Teaching and the human brain*. Alexandria, VA: ASCD Press.

Capra, Fritjof. (1975). *The Tao of physics*. Berkeley: Shambhala.

Capra, Fritjof. (1982). *The turning point: Science, society, and the rising culture*. New York: Bantam.

Covey, Stephen R. (1989). *The 7 habits of highly effective people*. New York: Simon and Schuster.

Crichton, Michael. (1990). *Jurasic park. New York:*

Davies, Paul. (1988). *The cosmic blueprint: New discoveries in nature's creative ability to order the universe.* New York: Simon and Schuster.

Davies, Paul. (1990). Cosmogenesis. *Creation Spirituality, 6* (3), 10-13.

Dewey, John. (1938). *Experience and education.* New York: Macmillan.

Doll, William E., Jr. (1993). *A post-modern perspective on curriculum.* New York: Teachers College Press.

Eisenberg, Ronni. (1986). *Organize yourself!* New York: Macmillan.

Eliade, Mircea. (1954). *The myth of the eternal return.* (Willard R. Trask, Trans.). New York: Pantheon Books.

Eliot, T. S. (1971). *The collected poems and plays of T. S. Eliot: 1909-1950.* New York: Harcourt, Brace, and World.

Gergen, Kenneth J. (1991). The saturated self: Dilemmas of identity in contemporary life. New York: Basic Books.

Gleick, James. (1987). *Chaos: Making a new science.* New York: Viking Press.

Good, Thomas L., & and Brophy, Jere E. (1990). *Educational psychology: A realistic approach* (4th Edition). New York: Longman.

Griffin, David Ray. (1988). *The reenchantment of science: Postmodern proposals.* Albany, NY: State University of New York Press.

Hawking, Stephen W. (1988). *A brief history of time: From the big bang to black holes*. New York: Bantam.

Heidegger, Martin. (1972). *On time and being*. (John Stanbaugh, trans.). New York: Harper Torchbooks.

Huebner, Dwayne. (1975). Curriculum as concern for man's temporality. In W. F. Pinar, (Ed.), *Curriculum theorizing: The reconceptualists*. Berkeley, CA: McCutchan.

Huebner, Dwayne. (1976). The moribund curriculum field: Its wake and our work. *Curriculum Inquiry*, *6*(2), 2-11.

Huebner, Dwayne. (1981). "Toward a political economy of curriculum and human development." In Henry A. Giroux, Anthony N. Penna, & William F. Pinar (Eds.), *Curriculum and instruction*. Berkeley, CA: McCutchan Publishers.

Kliebard, Herbert. M. (1986). *The struggle for the American curriculum: 1893-1958*. Boston: Routledge and Keegan Paul.

Kuhn, Thomas. (1970). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Kummel, Friedrich. (1965). "Time as succession and the problem of duration," in J. T. Fraser (ed.) *The voices of time*. New York: George Braziller. pp. 31-55.

Macdonald, James B. (1988). Theory, practice, and the hermeneutic circle. In William F. Pinar (Ed.), *Contemporary curriculum discourses* (pp. 101-113). Scottsdale, AZ: Gorsuch, Scarisbrick.

Nietzsche, Friedrich. (1968). The birth of tragedy. In Walter Kaufmann (Trans. and Ed.), *Basic writings of Nietzsche*, (Third Edition). New York: Modern Library.

Peter, Carl. (1974). Metaphysical finalism in Christian eschatology. *The Thomist, 38* (January), pp. 125-145.

Pinar, William F. (1988). Time, place, and voice: Curriculum theory and the historical moment. In William F. Pinar (Ed.), *Contemporary curriculum discourses* (pp. 264-278). Scottsdale, AZ: Gorsuch, Scarisbrick.

Prigogine, Ilya, & Stengers, Isabel. (1984). *Order out of chaos: Man's new dialogue with nature*. New York: Bantam.

Sirag, Saul-Paul. (1992). "Consciousness and hyperspace" in Jeffery Mishlove (ed.), *Thinking allowed: Conversations on the leading edge of knowledge*. Tulsa, OK: Council Oak Books.

Slattery, Patrick. (1992). Toward an eschatological curriculum theory. *JCT: An Interdisciplinary Journal of Curriculum Studies*, 9(3), 7-21.

Tozer, Steve. (1993, Fall). "Toward a new consensus among social foundations educators: Draft position paper of the American Educational Studies Association committee on academic standards and procedures." *Educational Foundations*. v. 7, n. 4, pp. 5-22.

Tucker, Mary Evelyn. (1993). *Education and ecology: Earth literacy and the technological trance*. Chambersburg,

PA: ANIMA Books.

United States Department of Education. (1994a). *Goals 2000: Community Update*. No. 14, pp. 1-4, June, 1994.

United States Department of Education. (1994b). Prisoners of time: Report of the national educational commission on time and leaning. Washington, DC: United States Department of Education Press.

Whitehead, Alfred North. (1933). *Adventures of ideas*. New York: Macmillan.

Wieman, Henry Nelson. (1969a). *The source of human good*. Carbondale, IL: Southern Illinois University Press, Articus Books. (Originally published 1946).

Wieman, Henry Nelson. (1969b). The revolution of our time. *Interchange*, (March-April), Center for Creative Interchange.

Wolcott, Harry. (1973). *The man in the principal's office: An ethnography*. New York: Holt, Rinehart, and Winston.